

Teacher Background Information (SC030400)

Magnetite is a magnetic mineral. It is found in rock strata associated with iron deposits. Magnetite is magnetic because its molecular structure has allowed it to retain the alignment of particles caused by the Earth's magnetic field during its formation millions of years ago. Magnets are attracted to materials containing iron.

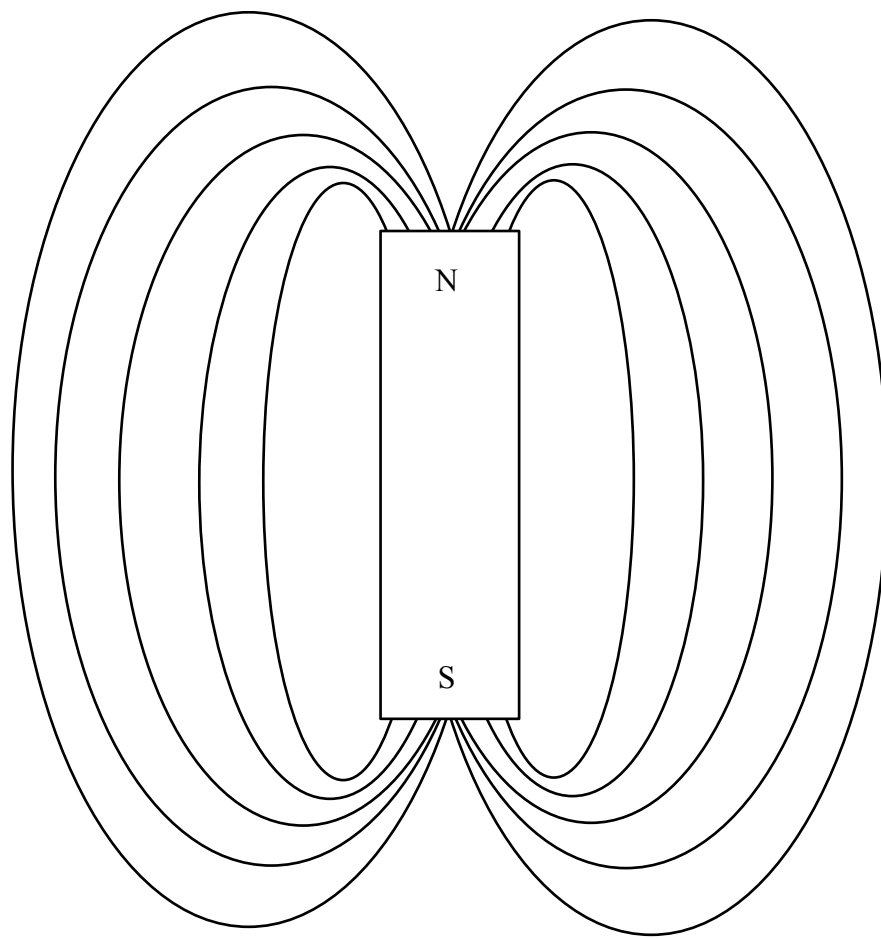
The north and south ends of the Earth are called the north and south poles. The ends of a magnet are called north and south poles. This is because the north pole of a magnet is north-seeking i.e. it always points to the magnetic north pole.

The first people to use a compass were Chinese sailors. They used pieces of magnetite, made into needles, to help them find their way if they were lost. A piece of magnetite, when suspended freely, generally comes to rest pointing north.

There are many legends about the discovery of magnets. One of them is about an elderly shepherd named Magnes, who was herding his sheep in an area of Northern Greece called Magnesia about 4,000 years ago. The legend says that the nails in his shoes became stuck in the black rock he was standing on. The rock was named "magnetite" after either Magnesia or Magnes himself. When people realized that magnets floating freely in water always pointed north, the name lodestone or "leading stone" began to be used. Sir William Gilbert in 1269 discovered that the Earth was a giant magnet when he observed that a magnetic needle free to move up and down dips toward the earth in many places.

The ends of a magnet are called north and south poles because the north pole of a magnet is north-seeking i.e. it always points to the magnetic north pole – and therefore the south pole of a magnet always points toward the south.

The Earth itself acts as a giant magnet with two poles and an enormous magnetic field. The Magnetic North Pole and the Geographic North Pole do not coincide. Geophysicists have found that the Earth's magnetic field reverses about every 200,000 years, although it hasn't happened during the last 800,000 years. It is not known whether this reversal occurs gradually, or whether there is a period of time when there is no magnetic field at all. This latter possibility could have accelerated the evolution of life on Earth. The Earth's magnetic field protects animal life from strong solar and cosmic radiation, which can cause genetic mutations. There appears to be a correlation between magnetic field reversals in the past and periods of accelerated evolution as well as the extinction of certain species. It is not known why these reversals occur.



A representation of the lines of force around a magnet. The force is the strongest where the lines are close together. Iron filings sprinkled on a piece of paper lying over a bar magnet will produce this kind of “picture.” The Earth has lines of magnetic force around it, which makes compasses point toward the magnetic north pole.